

# SUBTERRANEA BRITANNICA

**Bulletin No. 19**

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THE BULLETIN OF SUBTERRANEA BRITANNICA

No 19 - January 1984

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SUBTERRANEA BRITANNICA

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The bulletin has been compiled by Sylvia P. Beamon with assistance from Tom Doig, Rod Le Gear, Deryck Laming and Jenny Plumer.



The question of safety while investigating underground sites has once more been emphasised by a report in The Times (24.5.83) of how four construction workers, all in their twenties, died at the Carsington reservoir, near Wirksworth, Derbyshire. It seems that one man had climbed down a man-hole and was overcome by fumes, followed by his three colleagues who had died trying to rescue him. A delegate at the Arneau Symposium last year expressed concern for all those going underground to check the air every time. A matter of months before, three experienced French civil engineers, with whom he normally worked, had shared a similar fate by going into a 'safe' tunnel, but unbeknown to them fumes had entered through a newly formed crack in the roof. So the message is: take care and take adequate precautions when going underground. See also page 16. New insurance arrangements for underground expeditions will shortly be put in hand for our members with the NAMHO's scheme.

On a lighter note, the Steering Committee would like to draw attention to the excellent isometric drawing by Kevin O'Brien of the souterrain at Carnmore Td: this could become the future standard for drawings of such structures.

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OCTOBER DAY CONFERENCE, 1983

Sylvia P. Beamon

The Annual General Meeting was held on 15 October 1983 at 'Strathaird', Lucy Cavendish College, Cambridge, commencing at 10:30 am and chaired by Sylvia Beamon. We would like to thank Mrs Margaret Walker for her helpfulness and interest during her time on the Committee and welcome three new members, Mrs Valerie Bannister, Dr Deryck Laming and Mr Malcolm Tadd.

The meeting continued with the following papers, which we hope will appear in future editions of the Bulletin:

Malcolm Atkins of the Centre for East Anglian Studies, University of East Anglia, gave an interesting illustrated lecture on the Tunnels under Norwich. Unfortunately few of the workings are open generally. Most of the tunnels previously excavated for chalk have been located by drilling and surveying methods prior to buildings being erected.

Harold Mytum of York University spoke on excavated Welsh structural features which are possibly proto-souterrains, and also discussed Irish souterrains associated with settlement sites, the exact function of which still remains enigmatic.

David Perman of The Ware Society complemented the article by Roger Morgan on Scott's Grotto (Bull Sub. Brit. No 17) by showing the background and life-style of the 18th Century period in the malting town of Ware when the grotto was designed and built by members of the Scott family. Present-day slides prove several comparatively recent alterations by previous owners since its construction.

Under 'Brief Communications', Pruce Osborne showed slides of the catacombs under Paris; the sight of stacks of numerous skulls and long bones along extensive lengths of tunnel was quite extraordinary.

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DATES FOR YOUR DIARY

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|-------------------|--|
| 28th January 1984 | Subterranea Britannica Day Conference.   |
| 22-24th June 1984 | Subterranea Britannica Study Week-end, East Kent. For further details, apply: Mrs Valerie Bannister, 7 Moat House, Rhodaus Close, Canterbury, Kent, enclosing SAE. |
| 20th October 1984 | Subterranea Britannica Day Conference.   |

This paper deals with the historical changes which have taken place in quarrying millstones, and other stone, in the Eifel region of Germany. The site work has been carried out in the company of my wife, of Stephen Kindig, and of three local enthusiasts: Frau Gertrud Roder, Herr Fridolin Horter and Herr Peter Scherf.

The Eifel region of West Germany stretches from the Rhine to the Belgian and Luxembourg borders to the north of the Mosel. It is an area which has been subjected to intense volcanic activity of a recent geological period, and it is in the volcanic basalts that all the quarries are found. The volcano which had the greatest effect on the area is that in the east of the Eifel. The lake near the Abbey of Maria Laach is the remnant of this volcano, and the lava flow to the south of this lake stretches from the town of Mayen over the hills to Ober and Nieder Mendig. The majority of all the Eifel millstones which have been found have come from the Mayen-Mendig area; in the last two centuries almost all those produced came from this field and were shipped out through Andernach on the west bank of the Rhine.

Past millstone sites in the west of the Eifel appear to be the small cones which mark former volcanic activity. These are centred round small lakes - the Maars - in the neighbourhood of Gerolstein and Daun.

Querns, rubbing stones and millstones were produced from lava of both west and east Eifel from prehistoric times, at least as early as the Hallstatt period (1200-400 BC). The earliest form of quern is the saddle quern; the rotary is a later form. The Hallstatt quern is a boat-shaped stone on which a rubbing stone ground the grain. The later Hallstatt (600-400 BC) saddle quern is longer and has a triangular cross section. The superior form of the saddle quern, reached in the early and middle La Tene period, is familiarly called the 'Napoleon's Hat'. Here the triangular section of the earlier saddle querns is drawn out to a deep keel which was held rigid in the ground whilst the grinding was carried out by the rubbing stone on the flat upper surface.

The rotary quern has a much better known history. Most examples consist of a lower circular stone with a raised lip in which a circular, smaller stone is oscillated or rotated; the oscillating form is thought to be earlier. These rotary querns came into being in the La Tene period and have been produced ever since. Indeed, in the Eifel region, they were produced during the 1914-1918 war to enable private or black-market supplies of grain to be ground. Rotary querns take on many forms within the general description above, but the essential features are the slightly conical lower stone and a matching dished upper stone which rotated in the dish of the lower. The lip of the dish of the lower stone was pierced so that the meal could run out and be collected.

The Roman period was the first in which the millstone was driven by machinery and not by the muscle power of the user. The millstones became larger than before, with lower and upper stones of the same diameter. These stones show considerable sophistication; the grinding faces have a form of furrowing or dressing, and whilst they are slightly conical, look like smaller versions of the millstones which we know today.

The Roman period produced one form of millstone which is extremely rare: this is the double-coned donkey mill, the best-known examples of which are those in Pompeii. This millstone has a steeply-conical bedstone, and the runner stone is a large circular double cone which fits on to the cone of the bedstone whilst the upper cone acts as a hopper. Ears of stone were left on the upper stone so that the 'horse arm' could be attached. An example of this form of mill, made of Mayen stone, has been found in an excavation in London, and there is a bedstone cone in a garden in Mayen.

## Eifel Millstone Production (continued)

It is also in the Roman period that evidence of the export of the Mayen basalt millstones first become obvious. For example, one quarter of all the millstone finds in the Roman city of Silchester, north Hampshire, England, are Mayen stone, and millstones found in the Wallbrook of Roman London and in a boat which sank in the Thames are from the same area.

The mediaeval forms of millstones are now quite familiar. Here the modern form of face appears, the only indication of date being that the eye of the runner stone has a raised lip cut from the stone. Whilst the modern form of corn-grinding stone made of Mayen basalt is well known, there are other forms of grinding stones. In Mayen, where there is still a paper-making industry, there are edge-runners of Mayen basalt, and outside the Genovevaburg Museum there are several 'millstones' which have peculiar dressing to their faces; these were used in the production of paper. Basalt edge-runners have been used in cement mills, gunpowder mills and fruit crushers. Being a stone which can be produced in huge monolithic portions, it is popular for the large edge-runners required for many industrial uses.

The remains of the early quern production can be found in both the west and east Eifel regions. In the west of the region the remains are harder to find because there were no obvious quarries in the normally accepted sense. The wasters and the stones which were unfinished because flaws developed are to be found among the trees which cover the volcanic mounds. Two such mounds are at Rudersbusch and Bielscheck near Oberbettingen, and they typify many of the mounds which dot the open hilly farming landscape of the area. Here the wasters and unfinished saddle querns of the Hallstatt and La Tene periods can be found together with later types of rotary quern and millstone. Strangely, the wasters and other remains appear to be stratified: that is, the Hallstatt material is found in the lowest ring of the mound, with the quarried mediaeval millstones at the top. The saddle quern remains are mostly loose, with only one or two examples marked out and picked at but not severed from the rock. The millstone remains, being larger, are more frequently met with attached to the rock, but one or two have been dressed on one face and then severed from the rock and turned over.

In the east of the Eifel, where the production has always been far greater than in the west, the remains are not found in the volcanic mounds but in the vast areas of wasters which are exposed as modern quarries cut deeper into the basalt levels. These areas are being lost at a great rate as the quarries are exploited for roadstone, kerb stones and building stone. The quarries are being back-filled with domestic rubbish and revert to farm land. The remains described by Fridolin Horter and his father and by Dr Roder cannot now be seen, although they were recorded. The early quarryman in the Mayen area worked through the lava so that the basalt columns were an exposed face. He cut his stone on site and piled his rubbish behind him, and built drystone retaining walls every so often to stop the rubbish from falling on him. Now the modern quarries have exposed the rubbish layers at the top of the basalt on which they are working. The rubbish, naturally, contains the remains of saddle querns, rotary querns and millstones of every period.

In the Mendig area the quarrying methods are quite important for they vary according to the date of exploitation and when they are exposed by modern methods can be readily identified. The early quarries are essentially bell pits, mine shafts which descend vertically and open out into the strata at the bottom. The east Eifel lava has been covered at a later date by a thick layer of Bims, a granular pumice, which is fairly stable when cut to a vertical face but has to be faced with a drystone wall if exposed to the weather. The quarrymen cut down through the Bims, walled it as they went down, and built a staircase spiralling around the wall until they reached the working floor.

## Eifel Millstone Production (continued)

In both Mayen and Mendig the next stage was to dig a shaft, like a well, up which a windlass could haul men and materials. In this area the columnar basalt is interlocking, so that the caves formed by the removal of the stone had self-supporting roofs. The caves were made bigger with some of the columns left as props. The windlasses were hand-operated at first but later examples were horse engines ('Winde'). These horse engines were built to a standard, and rather crude, fashion; one can be seen outside the Genovevaburg Museum in Mayen. The engine consists of two principal posts carrying a top boom; this, usually an unbarked tree, projected at each end. The end over the hole in the ground carried the pivot of the crane arm and on the opposite end a stone was hung to provide a structural counterweight to the load coming out of the shaft. In the centre of the boom a vertical windlass was mounted on which the haulage chain was wound. The horse arm projected on both sides of the windlass so that two horses could work the engine. The diameter of the horse path was usually 8 m. When the load was wound out of the shaft a pole, permanently attached to the crane arm, was used to pull the load to the side of the shaft where it was deposited on to a cart and taken to the stone-dressing sheds. It is clear from the mass of material left in these mines that the stone was roughly dressed underground. Indeed, the illustrations in "Description of the underground volcanic quarries of Niedermennich... suitable for making excellent millstones" by Faujas-Saint-Fond, Annales du Museum 1 (Paris, 1809), show completed millstones both underground and on the haulage chain.

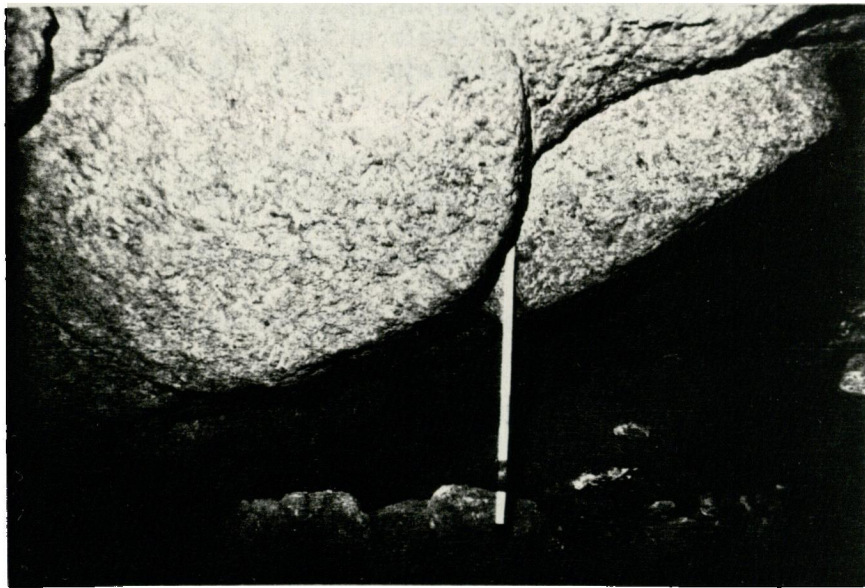
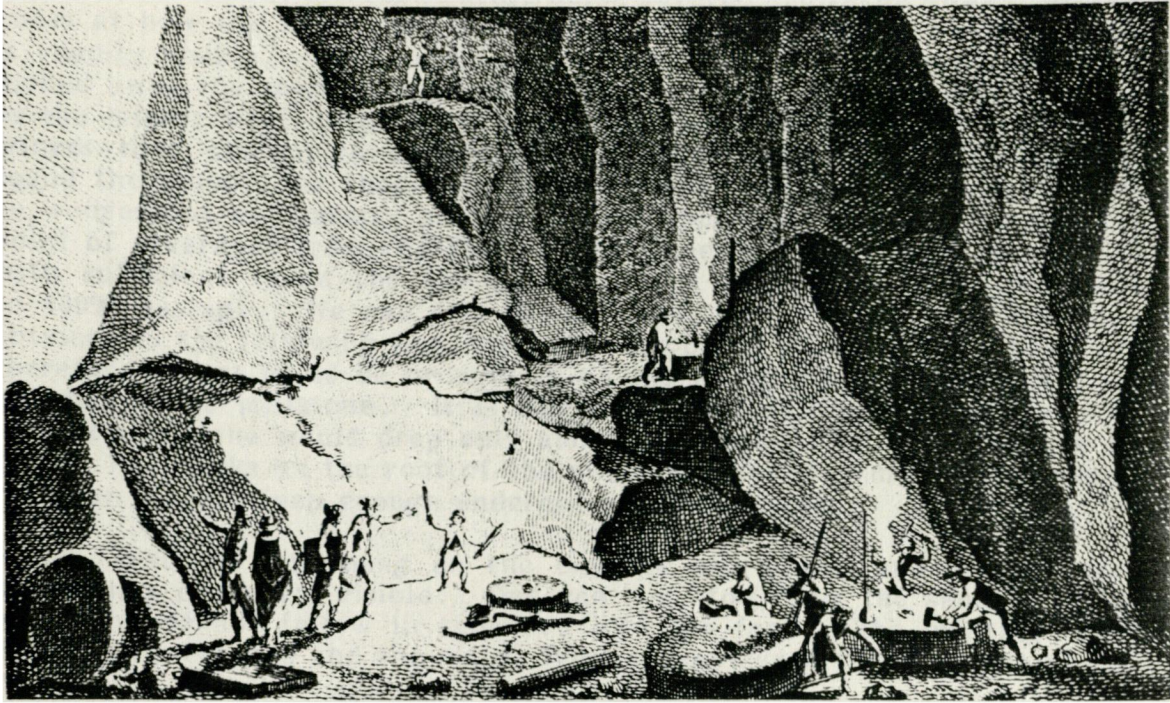
In the later part of the 19th Century the quarries were open pits of large size with the horse engines mounted around the rims. The pits were deep - sometimes as much as 50 m - with a layer of 10 or 15 m of overburden. The cranes had to be built so that they could haul the loads straight up from the quarry floors. Whilst the basalt walls were nearly vertical, the horse engines had to be built on vertical pillars rising out of the overburden; these were made of drystone walling using quarry waste for the masonry, and with large timber bonding pieces to hold them together. Electric cranes came into use early, and whilst the first were built on to the horse-engine pillars, later ones had their own pillars as they needed less space at the upper level. Rails connected the cranes to the masons' sheds dotted between the quarries at the surface. The electric cranes have been abandoned now that modern 'bulldozer' quarrying methods are in use and the quarries are entered horizontally from the side of the hill. Nowadays the stone dressing is all mechanical using powered saws.

The west part of the Eifel region has not produced millstones for some 400 years, although there are still live stone quarries for roadstone and some building stone in the area. One of the most fascinating monuments in this area is the Muhlsteinhohle at Roth by Gerolstein. This, in the view of the author, should be made into a national monument to protect it from damage, for it lies near the equally-important Eishohle and very close to some modern live roadstone quarries.

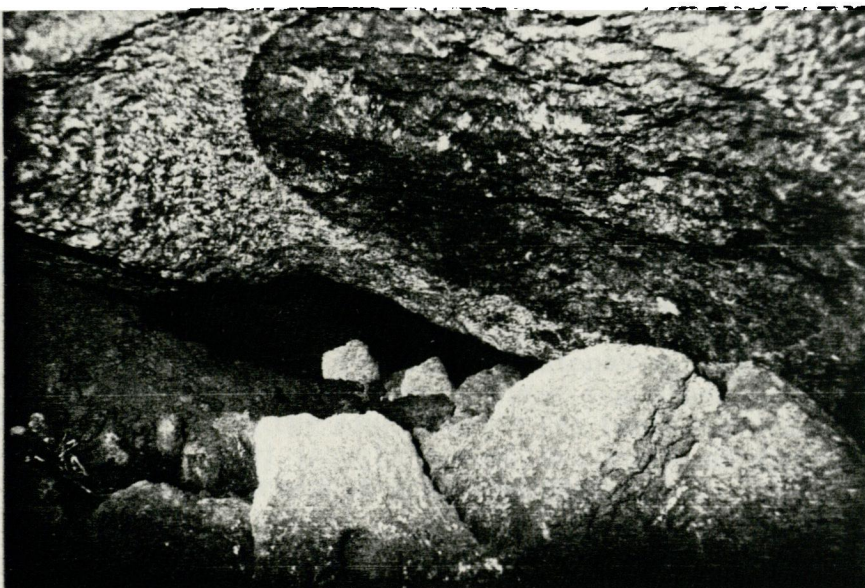
The Muhlsteinhohle went out of use in the 16th Century and its closure is associated with a legend which is typical of those which have accumulated around mediaeval mining. In this case a millstone maker went into the mine with his oxen and cart in order to bring out a millstone on a saint's day and the mine collapsed, entrapping man and animals. There is clear evidence of a roof slip at the end of the portion which is open at present. It is clear that the Muhlsteinhohle was used only for the production of millstones and it is their production at this mine which is important. The mine appears to extend along the strip of lava which was the most suitable for millstones. The entrance is a new one, the whereabouts of the original entrance having been lost. The mine was worked by overhead stoping, where the miners start at the lower level and cut upwards into the vein. The production of millstones at this site is important because they were completed in rough cylindrical



one of the illustrations from the 'Description of the Antiquarian  
quarries of Niedermennich' of 1809.



Millstone still  
on the roof of the  
Mühlsteinhöhle



A saucer on the roof  
of the Mühlsteinhöhle  
where a millstone has  
been cut away.



## Eifel Millstone Production (continued)

form on the face of the rock before being severed and taken away. We can only guess at how the millstones were taken out of this mine, but their creation is readily visible. The miners marked out the potential millstone and then picked away the surrounding face so that the millstone was gradually created as the miners went deeper. When the required thickness was arrived at, the miners then started to undercut it with their picks, working continuously round the stone. As they went in they fixed blocks of wood in the cut, not as wedges but as 'alarms', so that they dropped out as the stone reached the point of severance from the face. The saucer cut away to produce the stone with sufficient space for the pick to work round the stone represents up to 400% wastage. We can only surmise that, when ready, the millstone was obtained in the following way: the mine was being worked by overhead stoping, therefore a cart could be brought in on the waste material and raised until it was below the millstone. It is likely that a scaffold was built on the cart so that the stone would drop only about one centimetre when it came off the face. The marks on the roof of the mine indicate that millstones snapped off the face after a deep enough undercut had been made.

Many millstones still hang on the ceilings and walls, and the saucers from which they came are visible. One can see, too, how the saucers cross each other and do not follow in sequence into the face. The existing millstones have been measured and the sizes, from the entrance inwards, are as follows:

1.	1.37 m diameter	38 cm thick	millstone
2.	1.42 m diameter	33 cm thick	millstone
3.	1.62 m diameter		saucer
4.	1.42 m diameter		saucer
5.	1.47 m diameter		saucer
6.	1.57 m diameter		millstone
7.	1.47 m diameter		millstone
8.	1.52 m diameter	38 cm thick	millstone (broken)
9.	1.52 m diameter		millstone (broken)
10.	1.57 m diameter		saucer

It has only been possible to determine thickness where a clear undercutting had started.

This description is of a millstone mine in which the millstones were produced complete on the face. The ordinary production of millstones in the normal quarries is well recorded in material in the archives of the Amt für Rheinische Landeskunde in Bonn. Basalt columns of adequate cross section were selected for the millstones which were generally produced in the plane at right angles to the crystalline shape of the column. The block was roughly dressed to the approximate shape of the millstone, the rough face was cut across the block, and a centre point was chosen. A steel or wooden compass was then used to describe the circle of the millstone, and the sides were taken off to match this circle. When the rough cylinder had been formed, the stone was turned over on to its roughly flat face and the reverse face was then dressed on to it. The stone was then turned on to its edge, the faces dressed smooth and parallel and the rim cut to the new round. The eye was cut in the stone according to the requirement of the order. The stone was shipped away without the grinding face being finally dressed. The process shown in the photographs of the quarries at Crawinkel in Thuringia appears to be very close to that used at Mayen. (This was illustrated in The Transactions of the Fourth Symposium of TMS, pages 177-180.) Because of the nature of millstone grit, the process of producing millstones in the Peak District of Derbyshire, England, is rather different. Here the stone was dressed to an octagonal shape and then to the round before the faces were cut. The faces were cut by dressing two level troughs across the stone at right angles and then taking out the rough quarters to the same plane.

## Eifel Millstone Production (continued)

The production of Eifel millstones must have been enormous. They were exported by boat from Andernach from Roman times to places like the Low Countries and Britain. The town of Andernach on the Rhine has its famous treadwheel crane which was erected in 1534 and which ceased to work in 1911, which was used solely to lift millstones. A stone-dressing quarter grew up between the crane and the cathedral, by the town walls. The movement of millstones produced a considerable toll revenue for the Archbishops of Koln and the crane was built and maintained on their orders.

When German millers were invited to go to Pennsylvania in the late 17th Century by the agents of William Penn, they took with them the Mayen stones which were those they understood. Whilst they were to some extent displaced by the growth in the distribution of French burr stones, they never went out of favour, and are still found in mills both in Europe and in America.

The Eifel millstone industry and the quarries which supplied the stone deserve a better fate than the one which seems to be overtaking them i.e. being filled with the rubbish of Koblenz and Bonn or becoming neglected and overgrown.

This paper is to appear shortly in the Transactions of the Fifth Symposium of the International Molinological Society.

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## NOTES ON THE CAVE DWELLINGS OF THE CANARY ISLANDS

B.E. Osborne

Gran Canaria is one of the Canary Islands, in the Atlantic off the coast of West Africa. Nearly circular and covering an area of 592 square miles (1533 sq km), it is the third largest of the islands. It is principally volcanic in origin, and the terrain is mountainous apart from a narrow eastern coastal plain. The climate is arid and tropical, this being particularly relevant to the viability of simple long-term underground living accommodation.

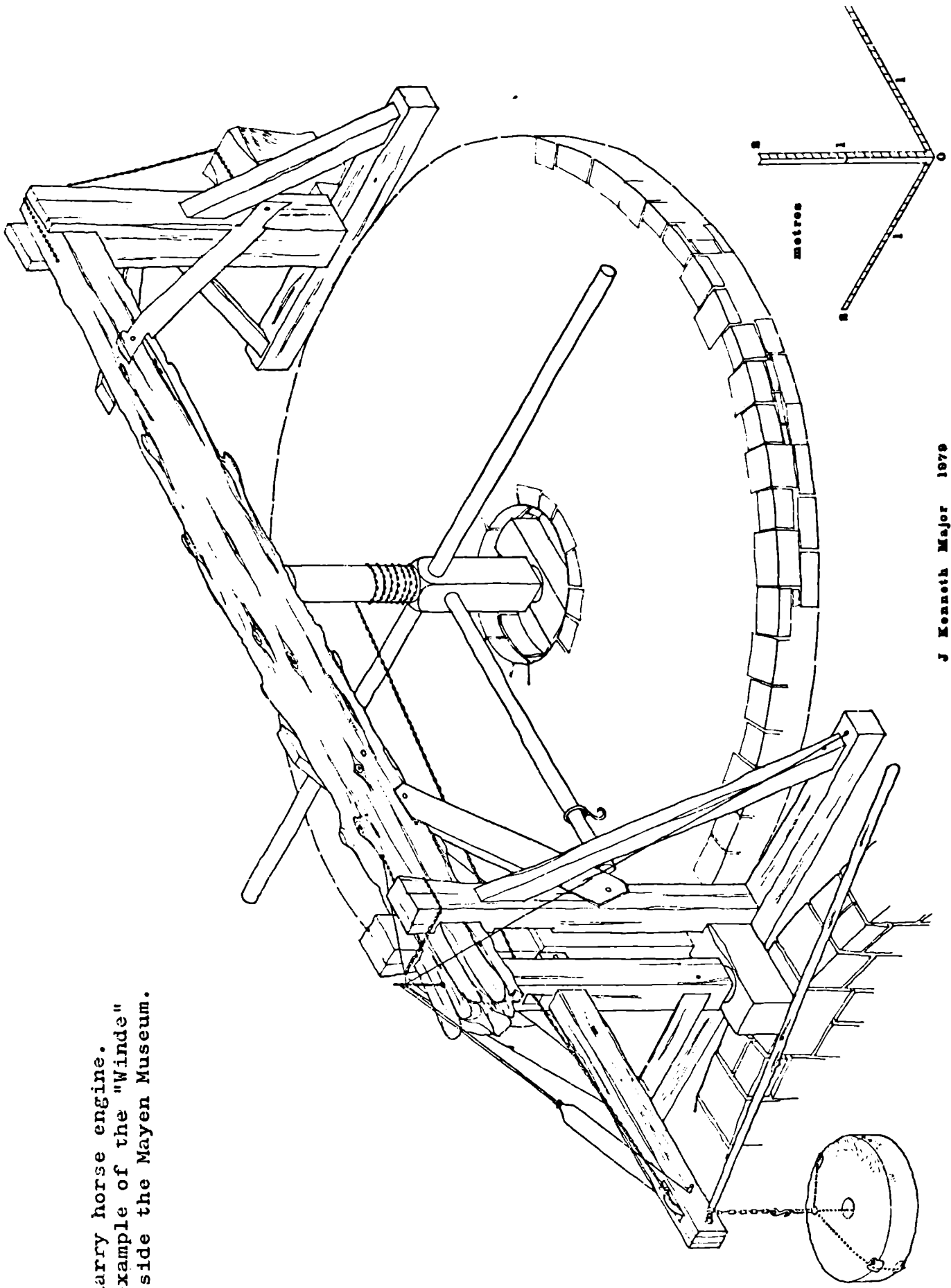
The island of Gran Canaria is renowned for its underground houses. Today the majority lie empty and abandoned, and it was some of these that the author explored in January 1993.

Prior to the 15th Century the island was inhabited by a race called the Guanche. They were stone-using farmers and used underground living accommodation extensively. In 1498 the Spaniards conquered the island and since then there has been a steady decline in the use of caves for habitation.

The majority of cave dwellings comprised one or two simple rooms or chambers. The origin of many were probably volcanic blow-holes modified for habitation although visual evidence suggests that a number had been entirely man-made in the relatively easy-to-work volcanic tuff where it occurs. There was also evidence of mining the tuff for building stone. The mines inspected closely resembled those seen at Caen in Northern France (1). The method of winning stone was similar although the Gran Canaria mines were less extensive than those at Caen.

The habitation sites are generally clustered in the more fertile valleys of the northern half of the island. As many as 20 or so entrances can easily be observed on a single hillside at varying levels, invariably associated with terracing for farming. Sunny slopes were preferred for sites; one inspected on a north facing slope was noticeably damp. Sizes varied and some were seen to have small windows - probably as a result of over-ambitious internal sculpturing. A second room commonly led off from the first, again size and shape

The quarry horse engine.  
This example of the "Winde"  
is outside the Mayen Museum.





## Cave Dwellings in the Canary Islands (continued)

varied but was no larger than the main room with no outside access.

Interiors varied. The more primitive abandoned caves, probably earlier, had rudimentary hollows cut out of the walls for storage, the head height was about 7 feet (2 m) and the walls were rounded and unfinished. Later caves had squared-off walls with rectangular entrances. In one instance the walls had been squared, rendered and painted white.

The older caves invariably had a stone bench of about bed size either hewn in the rock or built up of drystone rubble.

There was no evidence of fires in any of the caves inspected.

Today some caves have been incorporated into surface dwellings, are wired for electricity, have running water and are still inhabited. Many have simple wooden doors but are now used for storage, livestock etc. Many more are abandoned and partially collapsed. One larger abandoned cave on a hill top with three entrances was probably a community meeting place, possibly religious.

However, the most outstanding cluster of cave dwellings on Gran Canaria is without doubt the "Convent of Valeron" to be found on the north coast, west of Aracus. The site is under the protection of the Ministerio de Cultura.

High in the cliffs overlooking the coast road is a magnificent basalt arch, beneath which lies an infill of volcanic tuff. Hewn into this in very close proximity are 298 caves. They each comprise simple chambers at various levels, indicating a sizeable pre-Hispanic community. The village is about 300 m above sea level with superb views towards the sea. The basalt arch containing this community is about 25 m high and 30 m wide. Hewn steps are observable to the various levels and joist cavities indicate that there was probably a superstructure across the entrances also.

Originally hand cut with stone tools, the caves contain assorted hewn graffiti although the historical relevance is difficult to assess due to the difficulty of dating such secondary work.

Guanche tradition has it that the site was a 'pagan' convent. Daughters of the aboriginal noble families spent their youth in the small caves, but at the age of 35 years could choose marriage or remain in the sanctuary for life.

These caves were without doubt some form of community, probably a fortified village, but may have become an outcast colony for the sick at a later date. The "Cenobio de Valeron" was declared a national monument in 1978.

Hopefully these notes will stimulate more interest in the caves of Gran Canaria and more historic detail will come to light as a result.

### Reference

- 1 SOWAN, P.W. (1982) Underground Stone Quarries at Caen, Lower Normandy, France: part I Bull. Sub. Brit. No 15, 1982, p 11-16, and part II Bull. Sub. Brit. No 16, 1982, p 3-8.

### Sources

Ministerio de Cultura, Las Palmas  
"Canary Islands", Berlitz, Switzerland  
Field Exploration visit, January 1983

## STUDY WEEKEND IN THE DUDLEY AREA

24-26 June 1983

Margaret Guest

It was at the October 1982 Subterranea Britannica Day Conference when things really began, with a brief outline of the weekend programme given to members attending. A few days later Himley Hall near Dudley had been provisionally booked, and we were lucky that the fees then quoted were allowed to stand despite rising charges as we had booked so far in advance. I think the most worrying part of organising the weekend was estimating the cost when I didn't know how many would want to come and share the overheads.

The information went out to members in December, and it was quite a job to decide what to leave out - there were so many venues of interest. The response was gratifying; in the end we had a total of 32 participants.

Early in the year, as soon as enough bookings made the weekend viable, the Hall booking was confirmed, the canal boat booked, and the Museum Transport Group approached about using a bus for the weekend's transport. This brought us into touch with some real characters who were very keen to oblige, they just love a chance to use their mobile exhibits and I really felt everyone enjoyed the transport, especially the togetherness.

By the end of May the timetable was completed, letters, enclosures etc typed, copied and put in the post on 1st June. A big sigh of relief as that seemed quite a marathon of folding, sticking etc.

It was in the second week of June that first snags appeared. Firstly one or two cancellations; then, only 10 days before the event, the Black Country Museum caused me a few heart flutters when they wrote to say the Sunday lunch of faggots and peas in the pub was off! This was after I'd phoned the catering man on the Museum's suggestion and visited to fix it up. I did some dashing about and one or two phones got a bit hot, but everything was sorted out - although no faggots and peas were possible, a ploughman's lunch was offered instead. I was rather disappointed with that as it came nowhere near the standard of Saturday's lunch.

By 19th June cheques had been paid for everything except the Himley Hall account. Just a week to go, surely nothing could upset things now? Another cancellation or two, and another booking! Also a last-minute realisation that insurance cover had to be met!

At last Friday 24th June arrived. The housekeeper met me as arranged that afternoon and I was let into the secrets of her job, keys handed over and strict instructions about which loos and washing facilities were for females and which for males, also suggestions for room allocation, and the fact that in the recreation room no balls were available for table tennis. I didn't really think this important as I hoped the weekend wouldn't leave time to be filled by darts, table tennis etc. I settled very comfortably in the housekeeper's room, rows of keys on numbered hooks on the wall, feeling quite important. Soon came the first arrivals, almost before I'd finished my tea of pork pie and an apple. Martin was waiting to take the evening expedition to Dudley Zoo - first come, first served was the criterion of who should go that evening; fortunately, the others who wished to go were able to be accommodated on Saturday evening.

Vic Smallshire from the Dudley Canal Trust did his usual interesting talk on "Holes in the Ground", mainly in the Dudley area but some further afield including some at Box which reminded us of a previous very enjoyable Study Weekend in the Bristol area. After "time" was called in the Teacher's Centre we gathered in Wood House for more chat and a coffee.



## Dudley Study Weekend (continued)

Saturday morning Martin and I were up at an alarmingly early hour for a weekend and over to Himley in time, I hoped, to rouse any late sleepers and make sure they didn't miss breakfast. The double-decker bus duly arrived with its uniformed attendants and we departed almost on the dot as timetabled. After a look at the southern end of Dudley Tunnel we drove over Turners Hill to view the roadstone quarrying deep down, both sides of the road. This was certainly a first for that bus and its crew! They had never taken a double-decker over that hill, and didn't think one had ever taken that route in the past. One or two tight manoeuvres were necessary during the weekend causing a few heads to turn in our direction - and a few "hearts in mouth" inside the bus I think!

We were soon underground, exploring the abandoned limestone mines in Wrens' Nest Hill. The size seemed to amaze some members and of course only a part is left on view, another two-thirds having been filled in some years ago. Then over to Tipton where we embarked on the Trip Boat. I think we amazed the boat crew by our prompt time-keeping. After our guided tour through the part of Dudley Tunnel still open to visitors, Dawn had our lunch ready, which was well appreciated. Then it was time to explore the abandoned limestone mines in Dudley Hill - even more spacious and impressive than Wrens' Nest. This kept us busy until 5:00 pm. One of the highlights of the weekend for me took place next. We were on time at the rendezvous point arranged with the bus crew and had a few minutes to wait. In full dirt and dishevelment we were sitting on the verge when the jingles of an ice cream van was heard. There was soon a queue, much to the astonishment of the vendor. Not everyone had money in their pockets, including Martin and myself, so I was very pleased when someone "stood" us an ice.

Back to Himley Hall for our dinner, again everyone on time. Throughout the weekend I was really pleased and impressed with the way everyone co-operated and so kept to the timetable, enabling everything to be fitted into quite a tight schedule. On Saturday evening those of us who stayed at Himley set off on the Ice House Hunt - fortunately we found it, eventually. I'm not sure that everyone believed me when I said there definitely was one! Of course nature was in full bloom and the previous times when I had visited the ice house it was autumn; much less foliage and undergrowth to struggle through. We then saw some interesting slides brought along by several members. Many thanks to all who took the trouble of bringing them along, they really "made" the evening.

Again on Sunday morning our unusual early rising. This time not only breakfast to be made sure of, but rooms to be vacated, checked with the house-keeper, keys handed in etc. Fortunately everything was in its place - no one had spirited a pillow into their luggage.

Our bus arrived and we set off in the opposite direction to Saturday in order to visit Kinver and view the rock-houses. First Mr Bills of Kinver Civic Society spoke to us about what is known of the history of these rock dwellings, then we explored one site. Then we had time for drinks at "The Crooked House", the Glynn Arms pub. It gets its nickname due to damage caused to the building by mine workings below. Vic Smallshire on Friday evening had told us something of these coal mines, including the fact that Himley Hall itself, only half a mile away from "The Crooked House", was unaffected by subsidence. Lord Ward, Earl of Dudley, the mineowner, made sure a large pillar of coal was left beneath the Hall, his family home.

Then it was time to get over to the Black Country Museum, beginning with a tram ride to the main site and lunch in the pub in the reconstructed village. In the afternoon the last trip on "our" bus; this time to Coseley Tunnel, quite modern, wide enough for two boats to pass and a towpath each side. We walked through and rejoined the bus at the other end to go back to the Museum

## Dudley Study Weekend (continued)

and continue looking around there. The weekend was almost over, some members stayed in the Museum, others were ready to begin their journey home.

We thoroughly enjoyed both the weekend and organising it. Many thanks to everyone who came, thus making the weekend the success it was. Also much appreciation for the letters of thanks we've received, it really makes the effort worthwhile to know the weekend was appreciated and enjoyed.

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## Conference Report

### STUDY, PRESERVATION AND PRESENTATION OF THE INDUSTRIAL HERITAGE OF COALMINING - BELGIUM, THE NETHERLANDS AND GERMANY

23rd-27th February, 1983

Ivor J. Brown

This conference was organised in Belgium by The International Committee for the Conservation of the Industrial Heritage (TICCIH) in co-operation with the Provincial Museum for the Industrial Heritage, St Truiden; the Flemish Association for Industrial Archaeology, Gent; the Campine Coalmining Company, Houthalen (all in Belgium) and the Mining Museum of Rolduc, the Netherlands.

There were 27 participants and many other persons submitted written contributions in advance. From Great Britain were representatives of the National Association of Mining History Organisations, the Beamish Museum, and the South Wales Miners' Library, and mining museums and universities from Belgium, France, the Netherlands, West Germany, East Germany, Hungary and Sweden. In addition several non-mining universities and official historic monuments organisations were represented.

Many of the papers presented were preprinted and circulated together with other contributions as received from, for example, the USA, Argentine, Australia and New Zealand. Since these are available and are to be published in 'transactions', they are not described in detail here.

The programme began with an unofficial visit to the Railway Museum, Brussels on 22nd February, but the main visits and Working Sessions began on the 23rd. Visits were to the Bokrijk Open Air Museum, Limburg; underground at the Beringen Colliery, and the Beringen Settlement; the Museum of Iron and Coal, Liege; Blegny-Trembleur Colliery Museum; Steenkohlmijn, Valdenberg; and the Mining Museum at Rolduc, Kerkrade, and the Rolduc Monastery. After the conference we went to the Bochum Mining Museum and had a surface tour of the Ruhr Coalfield.

Working Session 1, at Bokrijk, had three papers: Coalmining in Belgium by R. Leboutte (Museum of Iron and Coal, Liege): only six coal mines remain open, five in the Campine and one in the Walloon Coalfield (which had 19 mines in 1970). Total production is now about 6 million tonnes. One colliery (at Argenteau) is proposed officially as a showmine and may open in 1983 but there are other preserved coalmining sites. The Discovery of Coal in Limburg and its Geology by E. Tys: the coalfield was discovered scientifically in the last decade of 19th Century; the equipment and methods used were described. The History and Heritage of the Limburg Coalmines by V. Van Doorstaer and A. Linters: the coalfield was opened up as concession blocks in a similar manner to the North Sea oilfields. Freezing had to be used for shaft sinking. Techniques were very much of the 20th Century, electric power stations and Koepe Towers. Workers at first lived in barracks then 'model villages' and 'garden villages' with the mining companies providing churches and schools etc.

## Conference: Coalmining Industrial Heritage (continued)

Working Session 2. The Heritage of the Mines by E. Wachtler (East Germany) and W. Kroker (West Germany): a potted history of the development of mining technology in Germany and of the work of the Freiburg Mining Academy and Bochum Mining Museum respectively. The Social Heritage around the Mines by R. Gunter (West Germany): consideration of the social conditions of the miner and of the problem of the present Turkish mining communities in Germany. The Oral Heritage of the Miners by H. Francis (Great Britain) concerned collection of videotape interviews with old miners, research being carried out jointly by the University of Wales and the Welsh Miners' Union. Different types of tape, social history, promoting ideas and documentary were demonstrated.

Working Session 3. On the Study, Preservation and Presentation of the Underground Heritage of Coalmining, introduced by the writer. As well as introducing the four coalmining museums in Britain, a paper on "The Caphouse Colliery Project" was presented. The range of coalmining museums around the world was discussed as was the importance of providing an 'experience' which used the senses to the full as distinct from the 19th Century glass-case image. It would appear that most of the working Belgian collieries are opened to the public on about seven weekends each year, working miners taking the visitors around with all proceeds going to the workers' benevolent fund. Zolder Mine had about 15,000 visitors last year, all over 16 years of age. There is a charge of £3.50 per head which also covers insurance and cleaning of clothing. Most dates are fully booked well in advance.

Working Session 4, at Rolduc, Netherlands: The Role of Local and Regional Mining Museums. Two papers were given by French delegates on the St Etienne area and Nord/Pas de Calais Coalfield. P. Francois gave details of the south east of France, the Le Creusoe area and preservation of headframes and buildings. It was hoped to convert a colliery called Prieve de Peron (1913-1963) to a show mine with an underground tour 400 m long about 50 m below ground. Entry is by shaft. P. Jessu of Lille (Nord/Pas de Calais) spoke of a big programme for industrial preservation in textiles, coal and maritime history. Most displays would have a central area with antennae going out and pulling in central features (Eco-museums). They are hoping to open a colliery museum with a board of 29 trustees of which the trade union will provide five.

R. Clarke gave a paper on the Beamish Museum Project, Co Durham, which is a regional museum. There was also discussion on the need to relate mining to the non-mining community who were affected by the sight of pit-heaps, open-casts, subsidence, noise, dust and even accidents (Aberfan). No museum ever showed these subjects.

Working Session 5: General Papers and the Need to Exchange Information. The writer presented a paper on the National Association of Mining History Organisations, describing its formation and function. Other topics discussed included the use of volunteers, employment of labour, industrial trails and the arguments for on-site preservation of industrial remains or their removal.

## Reviews

Sources for Quarry History: a handlist of possible subterranean workings from the "Report with Reference to the selection of Stone for Building the New Houses of Parliament", 1839.

As a result of the disastrous fire at the Palace of Westminster on the 16th October 1834, much rebuilding was necessitated, under the guidance of Sir Charles Barry, in 1840. An enquiry into the best stone to use for the new

## Review: Sources of Quarry History (continued)

buildings resulted in a report, published in 1839, on the products of 103 quarries throughout Great Britain. This report was by Charles Barry, Sir H.T. de la Beche, Charles H. Smith and William Smith to the Commissioners of Her Majesty's Woods, Forests, Land Revenues, Works and Buildings; it contains details of stone and quarries, many of which were of course subterranean, in 36 pages, of which 10 constitute large folding tables.

The 103 quarries for which details were given include the following in those Mesozoic strata most likely to include subterranean workings, and should be considered for further research:

Ancaster, Lincs  
Bath (Lodge Hill), Coombe Down, Somerset  
Bath (Baynton Quarry), Box, Wiltshire  
Bath (Drewes Quarry), Monckton Farleigh  
Beer, Devon  
Bevis's Quarry, East Tisbury, Wiltshire  
Calverley Quarry, Tunbridge Wells, Kent  
Chilmark Quarry, Wiltshire  
Cranmore Quarry, Doultong, Somerset  
Gatton Quarry, Surrey  
Giles (Saint) Quarry, near Lincoln  
Ham Hill Quarry, Somerset  
Haydor Quarry, Lincolnshire  
Heddington Quarry, Oxfordshire  
Ketton Quarry, Rutland  
Portland (Trade Quarry), Dorset  
Portland (King Barrow East End Quarry, adjoining Waycroft), Dorset  
Portland (Vern Street Quarry), Dorset  
Portland (Castle Quarry), Dorset  
Portland (Waycroft Quarries), Dorset  
Portland (Maggott Quarry), Dorset  
Portland (Goslings Quarry), Dorset  
Portland (Grove Quarry, Bowers), Dorset  
Portland (Grove Quarry, Red-Croft), Dorset  
Seacombe Quarry, Purbeck, Dorset  
Taunton or Teynton Quarry, Oxfordshire  
Totternhoe Quarry, Bedfordshire  
Windrush Quarry, Gloucestershire

Anyone researching the history of underground stone quarries, as for example in the Bath or Purbeck districts, Chilmark, Beer, Windrush, etc., should certainly consult this Report. A copy is available for public reference in the Library of the Institute of Geological Sciences in London.

**Limestone Mines in the West Midlands: the Legacy of Mines Long Abandoned.** Department of the Environment, 1983 24 pp, illustrated.

£1.50 from Five Ways Tower, Frederick Road, Edgbaston, Birmingham B15 1SJ.

This well-produced booklet and summary of the detailed report was prepared for the DoE and local authorities in the West Midlands by consulting engineers Ove Arup and Partners. The need for the study was the alarm caused in 1978 by subsidence resulting from abandoned limestone mines some 150 m below Wednesbury. Until this event, it had been thought that such deep workings posed no serious problems. The report contains some historical information on the mines, including some good photographs, with notes on layouts and methods of working. Thirtyone mines are named, and their locations shown approximately on a map and brief data tabulated (limestone seams worked, depth of working

## Review: West Midlands Limestone Mines (continued)

below surface, potential for collapse, importance of surface and structures above them, and so forth). The mechanics of collapse are described, both of the 'crown hole' and the 'general subsidence' kinds, and appropriate practical responses reviewed. Five possible lines of action are discussed (with brief practical details), from minimum work (prevention of public access), through monitoring (instrumentation and periodic photography of workings), investigation and treatment of the mine (deliberate collapsing, strengthening, filling or digging-out), to treatment of structures and services above areas at risk.

Copies of the full report, available for public inspection, are held at the appropriate local authority offices.

A separate document (unpriced, but the pair were supplied for £1.80 post-free) is entitled Limestone Mines in the West Midlands. Policy Considerations arising from the Study of Limestone Workings (28 pages, undated, no publisher stated, duplicated A4).

Paul W. Sowan

## News Items

### THE OCCUPIERS' LIABILITY BILL: a Note on New Legislation

This House of Lords Bill is concerned with the civil liability of an occupier to persons on his land and "... replaces with statutory rules the rules of the common law governing the duty of an occupier as to the safety of persons who are outside the Occupiers' Liability Act 1957, that is to say, persons who are on his land without his permission, either with lawful authority or without."

It enables the occupier of business premises, such as farm land, who permits visits for recreational purposes, such as rock climbing, to include terms in the permission which restrict or exclude his liability to such visitors in respect of the dangerous state of the premises.

This Bill has been introduced with the active support of the National Association of Mining History Organisations on account of its relevance to the exploration and study of underground structures on private land, the owners of which would under its terms be empowered to transfer to mine explorers and the like their legal liability as to safety and so forth.

Paul W. Sowan

### BEER CHALK MINES TO REOPEN

The Beer Chalk Mines in East Devon, which were abandoned early this century after 2000 years of working, are to be reopened for visitors. A conservation effort is being organised by local enthusiasts John Scott, Bill West and Mrs Gladys Grey to bring the extensive underground workings to a state where visitors can be admitted. There is much of interest in these room-and-pillar workings, which have been described as an underground cathedral; during times of religious strife, part of the mine was used as a chapel. The names of many stone workers, some back to the 18th Century, can still be found in perfect condition, and there are many marks showing how the stone was extracted. A geological survey has been undertaken by Deryck Laming, and the bat population examined by Bob Stebbings of the Nature Conservancy. The work of clearing out tons of mushroom compost and opening up some of the backfilled areas is now underway, possibly with help from Manpower Services later on, and the mines will be open in April.

Deryck Laming

NEW CANAL TUNNEL TO BE DUG IN DUDLEY

What will be the first canal tunnel to be dug in the UK since 1858 has been announced by Vic Smallshire, Secretary of the Dudley Canal Trust. Members who joined the Study Weekend in Dudley will remember Hurst's Cavern, where the canal boat stopped for lunch; the plan is to dig a new tunnel, 4 m in diameter and 60 m long, to link this with Singer Cavern to the south, by-passing a blocked section of tunnel. Work is expected to begin soon, and the new section, together with two new canal boats and other facilities, should be open to visitors early next year (see Bull. Sub. Brit. No 17, pp 10-16).

A grant for the work will come from the Department of the Environment, with part of the money going for roof-bolting in Singer Cavern. The Trust will also receive top-up grants from Dudley Metropolitan Borough Council; with Dudley Castle, Zoo, Canal Tunnel, the Black Country Museum and now the limestone mines, Dudley is in the forefront for tourist attractions in the Midlands.

Deryck Laming

FOR SALE

CRAWFORD, Harriet (ed.) Subterranean Britain - Aspects of Underground Archaeology. John Baker, London, 1979. (four copies are available at a much reduced price of £3.50)

BEAMON, S.P. and DONEL, L. (1983) £1.25 An Investigation of Royston Cave: reprint from the Proceedings of the Cambridge Antiquarian Society, Vol. LXVIII, 1978, Imray Laurie Norie & Wilson.

FALKENSTEIN, F. (ed. Arthur D. DUNN) 25 p Millstone Mine at Waldshut-Tiengen: translated from the German. Suggested further reading in relation to Kenneth Major's article on Eifel Millstone Production.

Subterranea Britannica (1978) £1.50 Proceedings of the Joint Symposium of Subterranea Britannica in conjunction with Societe Francaise d'Etudes des Souterrains, Cambridge 1978.

All publications available from Sylvia P. Beamon, 16 Honeyway, Royston, Hertfordshire SG8 7ES.

HOW TO JOIN SUBTERRANEA BRITANNICA

Membership of Subterranea Britannica is open to all those interested in the study of all kinds of man-made and man-used underground structures.

Meetings and visits are held several times a year: formal Day Conferences in Cambridge twice a year, occasional day visits to underground sites of interest, and an annual Study Weekend in areas of particular significance and historical interest.

Annual subscription rates are:

Individual membership £4.00; joint husband/wife £5.00; young people (14-18 years) £2.00; full-time students £2.00; corporate membership £10.00.

Application forms are available from the Secretary, Paul Sowan, 96a Brighton Road, South Croydon, Surrey CR2 6AD.

A RECENTLY DISCOVERED SOUTERRAIN AT CARNMORE TD.,  
CO GALWAY

Victor M. Buckley, Kevin O'Brien, Rory Woodman

In March 1982, while in the course of building operations, a souterrain was discovered by Mr P. Fox, Carnmore, Co Galway. The site was subsequently reported by Mr Fox to the National Monuments Branch, Office of Public Works, and was inspected and surveyed by the writers.

The souterrain is located in the td. of Carnmore\* 7 miles east of Galway city, to the north of the main Galway-Monivea road. The souterrain is L-shaped in plan, and consists of three chambers connected by two drop-hole creeps. The present entrance is at the junction of the foot of the L-shape, and the souterrain extends 15.8 m ENE-WSW and 6.5 m SSE-NNW. Construction throughout was of drystone masonry, with walls corbelled slightly inwards, with large 'key' or 'spall' stones projecting appreciably immediately below the lintels. The lintels were large limestone blocks, and the stone throughout was of local limestone.

No surface structures associated with the souterrain were visible; however, bulldozing had revealed the construction trench of the souterrain, 3 m wide and running ENE-WSW, composed of a mixture of yellow-brown sandy clay and limestone rubble.

Chamber 1 was 6.5 m long, 1.6 m wide at floor level and 1.5 m high, aligned SSE-NNW. The present entrance, caused by collapsed lintels when bulldozing, was at the NNW end of Chamber 1. The chamber was blocked by collapse at the SSE end, but the original entrance was most likely at some point beyond the present collapse.

Drop-hole creep 1 connects Chambers 1 and 2 via a short step and a drop-hole giving access to a creep, thus giving a box and tunnel effect. The creep is 2 m long, 70 cm wide, 1 m high at Chamber 2 and 90 cm high at the drop-hole end. The drop from the roof of the upper passage to the floor of the creep is 1.8 m. The entrance to the drop-hole measured 50 x 60 cm. (Two footholds jut from the face of drop-hole at floor level). To the WSW of the drop-hole is the step, formed of clay and stones, 1.4 m long, 90 cm wide, rising 75 cm above the floor of Chamber 1. The roof of the passage at this point is 1 m above the step.

Chamber 2 extends from ENE from drop-hole creep 1, and is 6.5 m long, 1.4 m wide at floor level, 1.3 m wide at roof level, 1.8 m high at the WSW end of chamber, 1.15 m at the ENE. At the ENE end a ramp, 1.5 m long and 90 cm high, forms part of drop-hole creep 2, and appears to consist of natural boulder clay left uncut during the construction of the souterrain. The roof of Chamber 2 is capped by seven large limestone blocks.

Drop-hole creep 2 connects Chambers 2 and 3, and is constructed as in drop-hole creep 1. The creep section is 2.1 m long, 90 cm wide and 75 cm high. The total drop of the drop-hole is 1.9 m from roof of Chamber 2 to the floor of the creep, and 90 cm from the mouth of the drop-hole to the floor of the creep. The drop-hole entrance is 60 x 65 cm wide.

Chamber 3 is 4 m long from the end of the creep to a point at ENE where it is blocked by collapse, 1.8 m wide at floor level, 1.3 m wide at roof level, and 1.65 m high where not obscured by collapse. The roof of Chamber 3 is capped by six large limestone blocks.

\* Parish: Athenry, Barony: Clare, Co Galway. O.S. 6" Sheet 83 (39.9 cm from west, 33.4 cm from south). National Grid: M403 294. OD 110 feet.

## Souterrain at Carnmore, Co Galway (continued)

### Discussion

The souterrains generally are thought to date from the Early Christian period, and to have been constructed c.600-1100 A.D. (1) for use as a refuge in time of trouble or for storage (2). The Carnmore souterrain is interesting as it fits into the category of an unenclosed settlement with souterrain, as at Craig's Hill, Co Antrim (3), and also because of the manner of construction of the drophole creeps using a ramp and dropping lintels to create the box and tunnel for the creep. This is most unusual, but can be paralleled at Millockstown, Co Louth, in Souterrain 1 (4). The souterrain at present under discussion is one of two in Carnmore td., and lies just to the north of the main concentration of souterrains in Co Galway in the baronies of Dunkellin and Kiltartan, which was the territory of the Ui Fiachrach Aidni in the Early Christian period.

### Acknowledgements

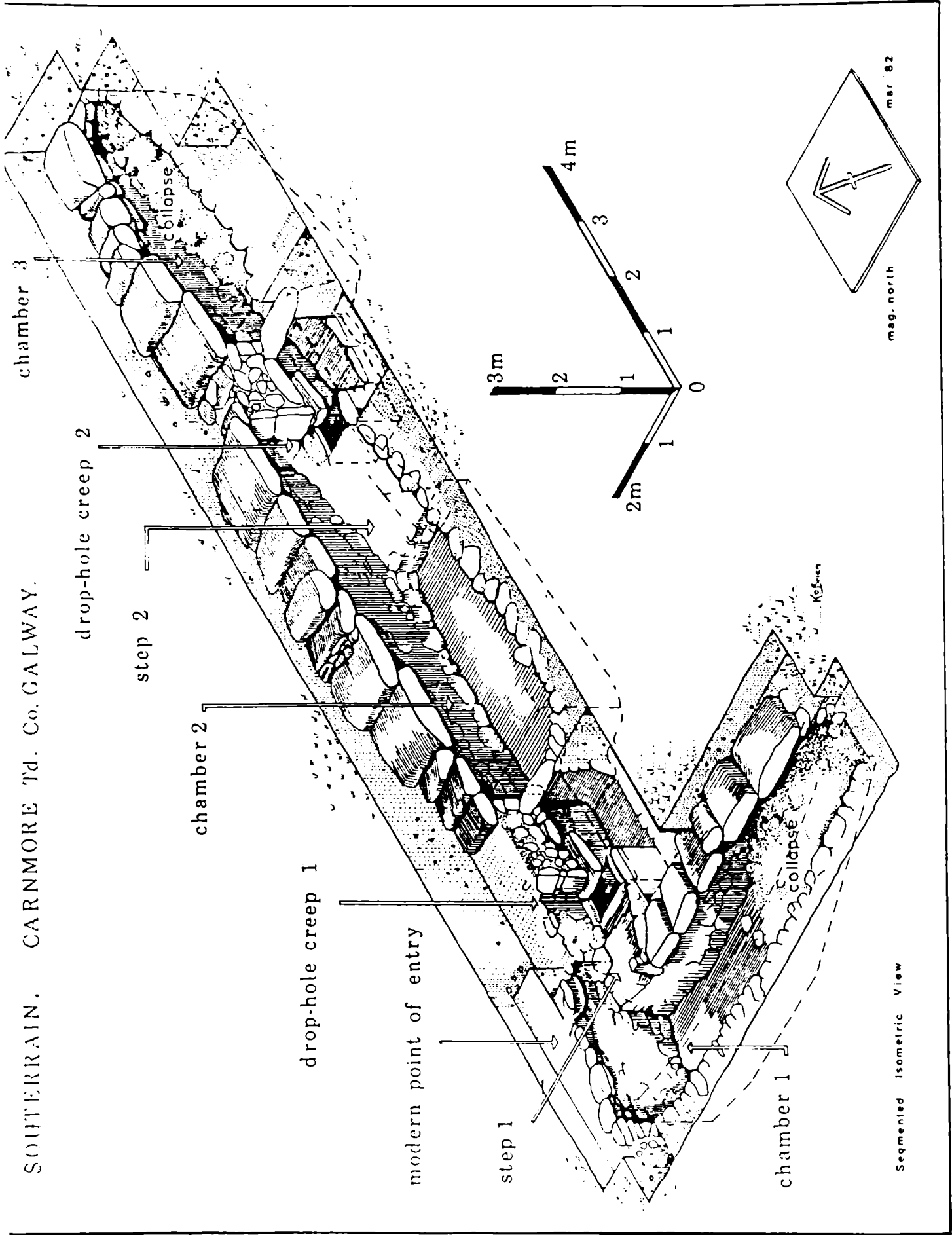
We would like to thank Mr P. Fox of Carnmore for reporting the site, and Mr R. Woodman of University College Galway for assistance in planning the exploration of the souterrain.

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(1973) vol 41, p 170.
- 3 WATERMAN, D.M. "A house and souterrain, Craig's Hill, Co Antrim":  
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- 4 MANNING, C. Personal communication.



SOUTERRAIN. CARNMORE Td. Co. GALWAY.



Segmented Isometric View

